

April 1988 Revised September 2000

74F08

Quad 2-Input AND Gate

General Description

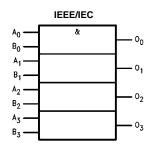
This device contains four independent gates, each of which performs the logic AND function.

Ordering Code:

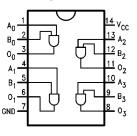
Order Number	Package Number	Package Description					
74F08SC	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow					
74F08SJ	M14D	14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide					
74F08PC	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide					

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbol



Connection Diagram



Unit Loading/Fan Out

Pin Names	Decerinties	U.L.	Input I _{IH} /I _{IL}	
Pin Names	Description	HIGH/LOW	Output I _{OH} /I _{OL}	
A _n , B _n	Inputs	1.0/1.0	20 μA/-0.6 mA	
O _n	Outputs	50/33.3	−1 mA/20 mA	

Absolute Maximum Ratings(Note 1)

C to +150°C Conditions

 $\begin{array}{ll} \mbox{Storage Temperature} & -65\mbox{°C to } +150\mbox{°C} \\ \mbox{Ambient Temperature under Bias} & -55\mbox{°C to } +125\mbox{°C} \\ \end{array}$

Junction Temperature under Bias -55° C to $+150^{\circ}$ C V_{CC} Pin Potential to Ground Pin -0.5V to +7.0V Input Voltage (Note 2) -0.5V to +7.0V Input Current (Note 2) -30 mA to +5.0 mA

Voltage Applied to Output in HIGH State (with $V_{CC} = 0V$)

 $\begin{array}{ll} \mbox{Standard Output} & -0.5\mbox{V to V}_{\mbox{CC}} \\ \mbox{3-STATE Output} & -0.5\mbox{V to +5.5}\mbox{V} \end{array}$

Current Applied to Output

Free Air Ambient Temperature 0°C to +70°C Supply Voltage +4.5V to +5.5V

Recommended Operating

Note 1: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

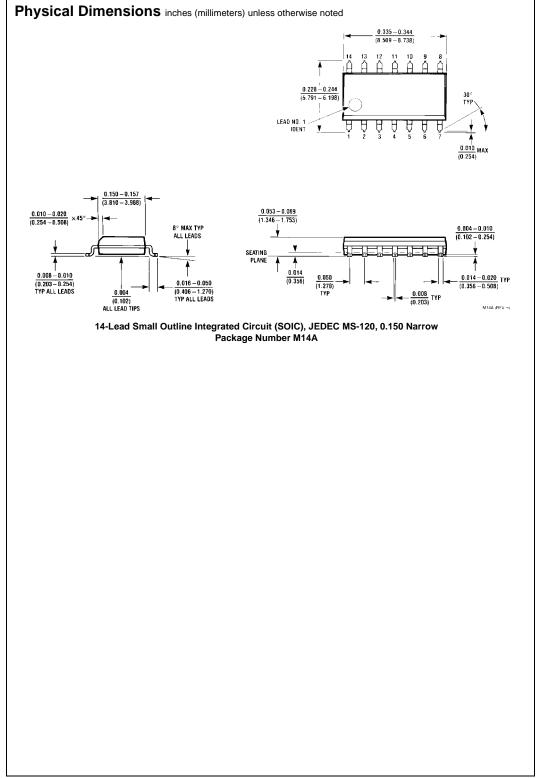
Note 2: Either voltage limit or current limit is sufficient to protect inputs.

DC Electrical Characteristics

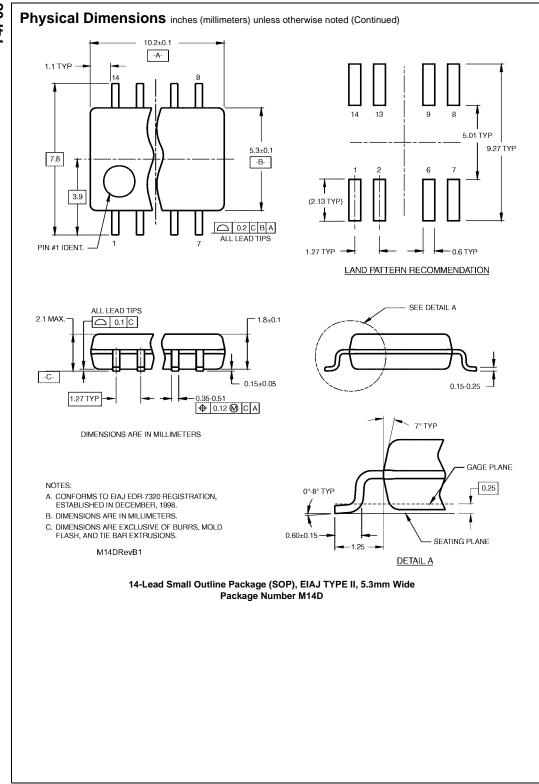
Symbol	Parameter	Min	Тур	Max	Max Units V _C		Conditions	
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal	
V _{IL}	Input LOW Voltage			8.0	V		Recognized as a LOW Signal	
V _{CD}	Input Clamp Diode Voltage			-1.2	V	Min	$I_{IN} = -18 \text{ mA}$	
V _{OH}	Output HIGH 10% V _{CC}	2.5			V	Min	I _{OH} = -1 mA	
	Voltage 5% V _{CC}	2.7			V	IVIII	$I_{OH} = -1 \text{ mA}$	
V _{OL}	Output LOW 10% V _{CC}			0.5	V	Min	I _{OL} = 20 mA	
	Voltage			0.5	l v	IVIIII	IOL = 20 IIIA	
I _{IH}	Input HIGH			5.0	μА	Max	V _{IN} = 2.7V	
	Current			3.0	μΑ			
I _{BVI}	Input HIGH Current			7.0	μА	Max	V _{IN} = 7.0V	
	Breakdown Test			7.0			VIN = 7.0V	
I _{CEX}	Output HIGH		50	50	μА	Max	$V_{OUT} = V_{CC}$	
	Leakage Current			30	μΛ			
V _{ID}	Input Leakage	4.75			٧	0.0	I _{ID} = 1.9 μA	
	Test	4.75					All Other Pins Grounded	
I _{OD}	Output Leakage			3.75	μА	0.0	V _{IOD} = 150 mV	
	Circuit Current						All Other Pins Grounded	
I _{IL}	Input LOW Current			-0.6	mA	Max	V _{IN} = 0.5V	
I _{OS}	Output Short-Circuit Current	-60		-150	mA	Max	V _{OUT} = 0V	
I _{CCH}	Power Supply Current		5.5	8.3	mA	Max	V _O = HIGH	
I _{CCL}	Power Supply Current		8.6	12.9	mA	Max	$V_O = LOW$	

AC Electrical Characteristics

Symbol	Parameter	$T_A = +25^{\circ}C$ $V_{CC} = +5.0V$ $C_L = 50 \text{ pF}$			$T_A = -55$ °C to $+125$ °C $V_{CC} = +5.0V$ $C_L = 50$ pF		$T_A = 0$ °C to $+70$ °C $V_{CC} = +5.0$ V $C_L = 50$ pF		Units	
		Min	Тур	Max	Min	Max	Min	Max		
t _{PLH}	Propagation Delay	3.0	4.2	5.6	2.5	7.5	3.0	6.6	ns	
t _{PHL}	A _n , B _n to O _n	2.5	4.0	5.3	2.0	7.5	2.5	6.3	115	



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Physical Dimensions inches (millimeters) unless otherwise noted (Continued) 0.740 - 0.770(18.80 - 19.56)0.090 (2.286) 14 13 12 11 10 9 8 14 13 12 0.250 ± 0.010 PIN NO. 1 IDENT PIN NO. 1 IDENT 1 2 3 4 5 6 7 1 2 3 $\frac{0.092}{(2.337)}$ DIA $\frac{0.030}{(0.762)}$ MAX OPTION 1 OPTION 02 $\frac{0.135 \pm 0.005}{(3.429 \pm 0.127)}$ 0.300 - 0.320 $\overline{(7.620 - 8.128)}$ 0.065 $\frac{0.145 - 0.200}{(3.683 - 5.080)}$ 0.060 4° TYP Optional (1.524) (1.651) $\frac{0.008 - 0.016}{(0.203 - 0.406)}$ TYP 0.020 (0.508) 0.125 - 0.150 0.075 ± 0.015 $\overline{(3.175 - 3.810)}$ 0.280 (1.905 ± 0.381) (7.112) MIN 0.014 - 0.0230.100 ± 0.010 (2.540 ± 0.254) TYP (0.356 - 0.584) $\frac{0.050 \pm 0.010}{(1.270 - 0.254)} \text{ TYP}$ 0.325 ^{+0.040} -0.015

14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N14A

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 $8.255 + 1.016 \\ -0.381$

N144 (REV.E)

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